Choices that Matter: Coalition Formation and Parties' Ideological Reputation[*]

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Abstract

This paper analyzes whether the formation of coalition governments provides voters with information about the policy preferences of parties in the cabinet. We argue that entering a coalition changes voter perceptions of a party's position *only* if the party can choose between several viable cabinets and the one it eventually joins is not seen as the ideologically closest. Otherwise coalition membership simply confirms voters' priors about the party. We find robust empirical support for our claim by integrating three complementary empirical approaches: aggregate-level analyses of party reputations in 5 Western European countries, individual panel data and quasi-experimental evidence.

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[*]This is a draft. Comments very welcomed.

1   Introduction

A prolific stream of literature in political science has examined the consequences of coalition governments for outcomes like fiscal policy (e.g. Roubini and Sachs, 1989; Perotti and Kontopoulos, 2002; Bäck and Lindvall, 2014), electoral accountability (e.g. Tavits, 2007; Fisher and Hobolt, 2010; Duch, Przepiorka and Stevenson, 2014) or government duration (e.g. Warwick, 1994; Bergman, Ersson and Hellström, 2013). It has been shown, moreover, that the ideological profile of coalition partners has consequences for the type of policies that the government implements (e.g. Hibbs, 1977; Tufte, 1978; Blais, Blake and Dion, 1993; Klingemann, Hoffebert and Budge, 1994; Schmidt, 1996; Bräuninger, 2005). Hence, given that the partisan composition of coalition governments influences policy-making, a party's decision to enter a multiparty cabinet may provide information to voters about its policy priorities.

Our paper analyzes whether the formation of government coalitions changes voter perceptions of where coalition allies stand on policy issues. We build on previous work by Fortunato and Stevenson (2013) to identify the conditions under which joining a coalition cabinet changes voter opinions of a party's political position. We argue that participation in a coalition is informative about a party's position *only* when the party has a *choice* between several viable coalitions and the one it enters was not initially perceived to be the ideologically closest option. Choosing to join a certain cabinet over other possible options reveals to voters that the party has more similar policy views to the partners it selected than to the others. Hence, if voters initially thought that the party was closer to any of the alternatives, the party's decision contradicts these beliefs and therefore voters need to adjust them accordingly. On the other hand, if voters already perceived the coalition that formed as the most ideologically consistent choice, the decision to join the cabinet simply confirms their priors.

We integrate three complementary approaches to test our empirical predictions.

We use party-level data to analyze the evolution of the left-right reputation of political parties in 5 coalition-prone Western European countries. We also leverage panel survey data from Norway to examine whether the formation of a coalition government changes voters' post-election opinions about party positions relative to their pre-election ones. Finally, we also take advantage of the random ordering in which survey respondents are contacted to compare the issue placement given to the British and German liberals before and after the announcement of two recent coalitions in which they participated.

All three types of empirical evidence offer support for our argument. Our results show that a coalition partner's perceived issue position only changes when the party had viable alternative options that voters considered ideologically closer. Otherwise, voter perceptions remain unchanged.

Our paper has important implications for democratic theory and party politics. We show that an elite-driven process like that of forming a new government has consequences for mass politics. Voters observe the new cabinet and update their opinion of where parties stand accordingly, either confirming or adjusting their previous perceptions. This is good news for democratic politics, as it suggests that citizen attitudes towards parties are responsive to a core dimension of party behavior like the decision to join the executive. Political parties, moreover, must incorporate the consequences for voter perceptions in their calculus to join a cabinet or not, since entering a government may affect the party's ideological image. Parties therefore face a trade-off: in cases where participation in a coalition may damage a party's policy reputation, seeking office now undermines the pursuit of votes in the future.

This paper is organized as follows. The next section reviews what we know about the determinants of voter perceptions of party positions. Section 3 presents our theoretical argument and hypotheses. In each of the following three sections we present different types of empirical evidence and discuss the results. We conclude with a summary of the main findings, their implications, and directions for further

research.

2 What We Know so Far

Citizen perceptions of where parties stand on policy issues is one of the main factors in voting decisions. Such relevance of voter beliefs about party positions has spurred some recent empirical research on how voters form and update these perceptions (Adams, 2012). The main conclusion of this strand of the literature is that parties' observable *actions* are more effective at reshaping voter opinions than policy *rhetoric* during election campaigns. Indeed, while Adams, Ezrow and Somer-Topcu (2011) and Fernandez-Vazquez (2014) find that party policy rhetoric has a limited or null impact on voter perceptions of party positions, it has been shown that the policies parties implement in office (Lupu, 2014) and their legislative record have a significant influence on party policy images. Specifically, polarization in roll-call voting increases the perceived ideological distance between parties (Hetherington, 2001) and legislative discipline reduces voter uncertainty about party positions (Grynaviski, 2010).

Since the partisan leanings of cabinet members matter for policy outcomes, the choice of coalition partners could also shape citizen beliefs about parties' issue preferences. In fact, the literature on coalition formation has consistently found such party preferences are a relevant predictor of the type of cabinets that form after an election. As Martin and Stevenson (2001) show, parties prefer to form coalitions with ideologically similar partners, everything else equal. Hence, the composition of coalition cabinets could provide information to voters on parties' policy commitments.

The findings in a growing stream of literature support this claim. Most notably, Fortunato and Stevenson (2013) argue that voters use coalition participation as an heuristic to infer parties' ideological positions. Focusing on Western European

coalitional democracies, Fortunato and Stevenson's evidence indicates that members of coalition governments tend to be perceived ideologically closer than parties outside the coalition even after controlling for the distance between their manifesto positions.

Similarly, Adams, Ezrow and Wleizen (2015) find that voters infer the position of parties on European integration matters using an heuristic based on who they partner with in a coalition government. In another recent piece, Fortunato and Adams (2015) show that voters map the Prime Minister party's position onto the placement of junior partners but not vice versa. Overall, these results would suggest that choosing to join a coalition changes voter perceptions of where coalition partners stand on issues regardless of the potential alternatives parties face prior to the formation of the coalition.[1]

3 Our Argument

Our paper qualifies the scope of the argument in Fortunato and Stevenson (2013). We assume that voters update their perceptions of where a party stands on policy issues if its behavior contradicts their prior opinion about it, but not otherwise. Voters anticipate that parties want to get into office, but that given several options to enter a coalition government, parties prefer partners that are ideologically closer. Therefore, voters will *only* change their mind about a party if it joins a coalition that was *not* considered ex-ante as the ideologically closest. Otherwise, the party's decision will be consistent with voters' priors and they will have no reason to update these.

We can illustrate this point with the following example: A party with a reputation of being on the left is pivotal in the formation of either of these two coalitions, a) one with other left-wing parties, and b) another with parties on the right. While its

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[1]Another approach to the relationship between coalition governments and voter perceptions of party positions assumes the existence of "true" positions. Spoon and Klüver (2015), for instance, argue that the blurred lines of responsibility in coalition governments hinder voters' ability to correctly judge party positions, although the magnitude of misperceptions depend on the coalition context.

perceived ideological position should not change if it chooses the former alternative, it will shift if it joins the latter cabinet, as voters infer that the party is actually closer to the right than they originally thought.

More generally, we argue that joining a coalition cabinet may be more informative about a party's policy preferences when the party can choose between several viable alternatives. Indeed, entering the only available coalition just implies that the party is not far enough from the overall cabinet position to be better off declining to participate in the cabinet. Since this is consistent with a wide array of ideological positions, cabinet membership is not very informative about the party's preferences. With multiple alternatives, in contrast, the choice of one coalition alternative over the others reveals to voters that the party is ideologically closer to that coalition than to all the rest, and in so doing it either confirms initial priors or prompts voters to revise them.[2]

In sum, we claim that voter updating depends on the menu of viable coalitions and voters' own priors about where parties stand. The observable implications that derive from our argument and that we test empirically are the following:

Hypothesis   Voter perceptions of a party that enters a coalition government **only**
             change when the party had alternative options perceived to be ideolog-
             ically closer to the party.

Corollary 1   Voter opinions do not change if the party joins the cabinet that was
             perceived to be closest among all viable alternatives.

Corollary 2   If a party has only one potential coalition to join, the decision to enter
             does not shift voters' attitudes.

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[2]We detail the logic of our argument in a model of voter updating that is available in the Supporting Information.

4 Evidence from Aggregated Data at the Party Level: The Case of Five West European Countries from 1979 to 2011

Data and Empirical Strategy

Our outcome of interest are voter perceptions of party positions following the formation of a new cabinet. In our party-level analysis we focus on parties' left-right reputations for reasons of theoretical relevance and data availability. The left-right dimension provides a good summary of European party positions on economic and social issues (Benoit and Laver, 2012) and it is a relevant predictor of voting decisions (Van der Eijk, Schmitt and Binder, 2005; Lachat, 2008). From a pragmatic point of view, survey data on parties' left-right positions are available for several European countries over a long period of time. Among European countries with a long-standing tradition of including left-right placement items in their election study questionnaires, we center our attention on countries where coalition governments are frequent: Norway, Sweden, Denmark, Germany and the Netherlands.

We operationalize voter perceptions of party left-right positions as the average left-right placement given to political parties in surveys fielded after legislative elections. The main data source for these surveys is the European Voter Database (EVD), a collection of European national election studies.[3] Since the last elections covered by the EVD took place in 1998, we have updated our data with more recent surveys.[4] We calculate the average location attributed to a party among the

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[3]For further information about this database, please refer to the following website: www.gesis.org/en/services/data-analysis/survey-data/international-election-studies/the-european-voter-project/.

[4]These newer surveys come from either country-specific election studies or from the Comparative Study of Electoral Systems (CSES). Most of these surveys use a $0-10$ scale. For surveys using a $1-10$ axis instead, the data has been rescaled. In such cases, we have mapped the extreme values into 0 and 10, and applied the function $newscale = (oldscale - 1) \cdot \frac{10}{9}$ to the intermediate values.

Table 1: Countries included in the analyses and years in which post-election surveys where conducted.

Country	Years
Denmark	1994, 1998, 2001, 2005, 2007, 2011
Germany[6]	1998, 2002, 2005, 2009
Netherlands	1981, 1982, 1986, 1989, 1994, 1998, 2002, 2003, 2006, 2010
Norway	1977, 1981, 1985, 1989, 1993, 1997, 2001, 2005, 2009
Sweden	1979, 1982, 1985, 1988, 1991, 1994, 1998, 2002, 2006

whole sample of respondents. We draw these survey data from post-election waves to maximize the probability that it is already clear which government has formed or is likely to form *before* the survey is fielded.[5] The countries and years included in our dataset are listed on Table 1.

For each party-year pair, the variable $Position_{t+1}$ denotes the average left-right position given to the party in that year's post-election survey. $Position_t$, in turn, reflects the average position in the *previous* survey. To give an example, $Position_{t+1}$ for the German SPD in 2009 is the average placement measured in that year's post-election survey, while the source for $Position_t$ is the 2005 election study. Both variables range from 0 to 10, where 0 indicates a "far left" position and 10 a "far right" one.

We test our hypotheses using the *change* in average left-right placements as our dependent variable: *Update* takes the difference between the post-election and pre-election positions ($Position_{t+1} - Position_t$). This variable returns how far to the right (positive values) or to the left (negative values) voter perceptions of the party

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[5]The process of coalition formation may in some cases drag on for months, and therefore it is possible that some cabinets have formed *after* the survey field date. Ours is therefore a conservative approach: To the extent that post-election survey waves are conducted before a coalition agreement is reached, our results will underestimate the effect of the membership in a coalition on a party's policy image.

[6]German national election studies have asked respondents to place parties on a left-right scale since 1980. However, until 1998 these survey items were included in pre-election waves rather than in postelection ones.

have moved with respect to the previous position. Naturally, it potentially ranges from -10 to 10.[7]

The first explanatory variable we specify is $Distance_{RG}$. It computes the distance between the position where voters placed the party *before* the election, $Position_t$, and the position of the government that eventually formed. We apply Gamson's Law to calculate the overall left-right position of coalition cabinets. According to Gamson (1961, p.376), "Any participant will expect others to demand from a coalition a share of the payoff proportional to the amount of resources which they contribute to a coalition". Hence, applied to policy formation, this logic entails that the policy position of a government can be equated to the seat-weighted average of the positions of the members of the coalition (Amat and Falcó-Gimeno, 2014). According to Martin and Vanberg (2014), this is in fact an intuitive expectation that serves as a foundational assumption for various studies, both theoretical and empirical, in the field of coalition politics and parliamentary government. Empirically, Meyer and Strobl (2015) find that voter perceptions of coalition policy positions seem to correspond to a weighted mean of the positions of government parties.[8] To summarize, positive values of $Distance_{RG}$ indicate that the new government is to the right of the position attributed to the party before the formation process and negative values otherwise.[9]

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[7]We also estimate a model in levels using the post-election position $Position_{t+1}$ as our dependent variable. The results are offered in the Supporting Information section.

[8]A recent paper by Bowler, Gschwend and Indridason (2014) challenges the assumption that voters use Gamson's Law to estimate the relative influence of coalition partners on policy-making. They find that that voters attribute a disproportionate influence to minor coalition partners, yet they do not think that all partners have the same influence regardless of size. The real perception of coalition policy, as far as Bowler, Gschwend and Indridason's (2014) findings can tell, lies somewhere in the middle. Despite these findings, we stick to the Gamson's Law heuristic as it has been by far the most used in the field.

[9]We have calculated the position of the real government as the seat-weighted average of the cabinet members' positions even for minority governments. For single-party minority governments, therefore, the position of the government coincides with that of the party. It is true that minority governments need the consent of opposition parties to make policy (Falcó-Gimeno and Jurado, 2011), but given the possibility these governments have to build law-specific agreements with other parties, we think it is most reasonable to consider cabinet members only in calculating the position of the minority government. Nonetheless, as explained below, we have left minority governments aside when considering feasible (minimum-winning) alternatives. Otherwise, each individual party would make for a government alternative.

The key factor that determines changes in voter perceptions is the presence of viable alternative coalitions to the government that actually formed. We define an indicator variable using the following procedure. First, we take the parliamentary composition resulting from elections using the *ParlGov* dataset compiled by Döring and Manow (2012). We then compute all the possible Minimal Winning Coalitions (MWC) that could potentially form in each parliament. For that purpose we used Bräuninger and König's (2005) "Indices of Power IOP 2.0" software.[10] Table 2 provides information about the MWCs of each parliamentary configuration.

We assign a left-right position to each possible MWC using, again, Gamson's logic. We can therefore infer whether a party is perceived to be closer to the government that formed or to any of the alternative viable coalitions. We define a dichotomous variable, $Alternative_{MWC}$,

$$
Alternative_{\text{MWC}} = \begin{cases} 1 & \text{if } |Position_{MWC} - Position_t| < |Position_{RG} - Position_t| \\ 0 & \text{if } |Position_{MWC} - Position_t| \geq |Position_{RG} - Position_t| \end{cases}
$$

where $Position_{MWC}$ and $Position_{RG}$ refer to the position of the closest alternative MWC and the position of the government that actually formed, respectively. Hence, $Alternative_{MWC}$ takes the value of 1 whenever an alternative viable coalition was perceived to be closer to the focal party than the cabinet that eventually emerged.

The presence of the party in the government that actually formed is identified by the dummy variable *Party Status*, which takes value 0 if the party remains in opposition and 1 if it enters the government. This variable is used to create interactions with the variables $Distance_{RG}$ and $Alternative_{MWC}$ in order to identify the relevant conditional effects. We also control for initial left-right placement ($Position_t$) to account for possible 'ceiling and floor effects'.

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[10]By focusing on the menu of possible minimum winning coalitions (MWC), we adopt a conservative approach to evaluate our hypothesis. If, in addition to MWC, voters also consider the minority and surplus majority coalitions that a party could have formed, then there might be misclassification in our indicator of whether the coalition formed is the ideologically closest among all viable ones. Such coding error, if it exists, will bias downward our estimate of the difference in voter updating between the ideologically closest and the other coalitions.

Table 2: Descriptive Statistics on Minimal Winning Coalitions

Country	Year	N. MWC	N. Parties
Denmark	1994	33	4.45
Denmark	1998	95	5.52
Denmark	2001	24	4.38
Denmark	2005	20	4.00
Denmark	2007	23	4.17
Denmark	2011	55	5.18
Germany	1998	4	2.25
Germany	2002	3	2.00
Germany	2005	7	2.86
Germany	2009	4	2.25
Netherlands	1981	24	4.38
Netherlands	1982	3	2.00
Netherlands	1986	3	2.00
Netherlands	1989	10	4.00
Netherlands	1994	115	5.80
Netherlands	1998	17	4.00
Netherlands	2002	33	4.45
Netherlands	2003	13	3.69
Netherlands	2006	42	4.57
Netherlands	2010	40	4.53
Norway	1977	6	2.50
Norway	1981	7	3.00
Norway	1985	6	2.83
Norway	1989	8	3.13
Norway	1993	8	3.13
Norway	1997	8	3.38
Norway	2001	12	3.17
Norway	2005	14	3.50
Norway	2009	8	3.13
Sweden	1979	4	2.25
Sweden	1982	5	2.40
Sweden	1985	5	2.40
Sweden	1988	6	2.50
Sweden	1991	16	3.56
Sweden	1994	7	2.57
Sweden	1998	14	3.50
Sweden	2002	9	3.33
Sweden	2006	13	3.38

Results

Given that our argument posits that the effect of participation in coalitions on voter perceptions is inherently conditional, we summarize our evidence presenting the marginal effects of the main independent variable at various values of our modifying variables, which are our quantities of interest.[11] Table 3 reports the marginal effect on voter perceptions of the distance between the party and the government that forms for substantively relevant values of the modifying factors. Positive and statistically significant estimates of the effect of $Distance_{RG}$ on $Update$ indicate that the perceived left-right position of the focal party shifts in the direction of the position of the new government. In other words, a positive estimate indicates that the more rightist (leftist) the position of the new government, the more to the right (left) the shift in voter perceptions. These estimates come from the following linear regression model:

$$Update = \alpha + \beta_1 Position_{t} + \beta_2 Distance_{RG} + \beta_3 Party\ Status + \beta_4 Alternative_{MWC}$$

$$+ \beta_5 Party\ Status * Alternative_{MWC}$$

$$+ \beta_6 Distance_{RG} * Party\ Status$$

$$+ \beta_7 Distance_{RG} * Alternative_{MWC}$$

$$+ \beta_8 Distance_{RG} * Party\ Status * Alternative_{MWC}$$

In line with our hypotheses, results in Table 3 suggest that joining a coalition cabinet produces a change in voter perceptions only when there was a viable alter-

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[11] As Brambor, Clark and Golder (2006) suggest, evidence about conditional relationships require to go beyond the traditional results table and convey quantities of interest like the marginal effect of X on Y for different values of the modifying variable. "The analyst cannot even infer whether X has a meaningful conditional effect on Y from the magnitude and significance of the coefficient on the interaction term either. [. . .] it is perfectly possible for the marginal effect of X on Y to be significant for substantively relevant values of the modifying variable Z even if the coefficient on the interaction term is insignificant. Note what this means. It means that one cannot determine whether a model should include an interaction term simply by looking at the significance of the coefficient on the interaction term. Numerous articles ignore this point and drop interaction terms if this coefficient is insignificant. In doing so, they potentially miss important conditional relationships between their variables" (Brambor, Clark and Golder, 2006).

Table 3: Marginal effects of $Distance_{RG}$ on $Update$

| Party Status	Alternative MWC	dy/dx	s.e.
All Parties		-0.010	0.027
Government Parties		0.010	0.071
Government	NO	-0.067	0.135
Government	YES	0.083**	0.041

Standard errors in s.e. column.

*** p<0.01, ** p<0.05, * p<0.1

native that voters considered to be ideologically closer. In other words, the position of the government that forms, $Distance_{RG}$, influences voter perceptions of a coalition member but only provided that this party had a closer alternative MWC in which it could have participated. In all other cases, the relative position of the new government does not affect voters' perceptions.

The key conditional effect is illustrated in Figure 1. It plots how the relative position of the new coalition influences voter perceptions of where coalition partners stand on the left-right dimension.[12] As we can see, the overall left-right position of the new cabinet only affects what voters think about coalition allies when the party had a closer alternative MWC. When this alternative was absent, in contrast, coalition formation does not provide any relevant information over the real position of the party.

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[12]This figure therefore does not include the effect of the government placement on opposition parties, which according to the results in Table 3 is not distinguishable from zero.

Figure 1: Predictive Marginal Effects with 95% CI (Only Government Parties)
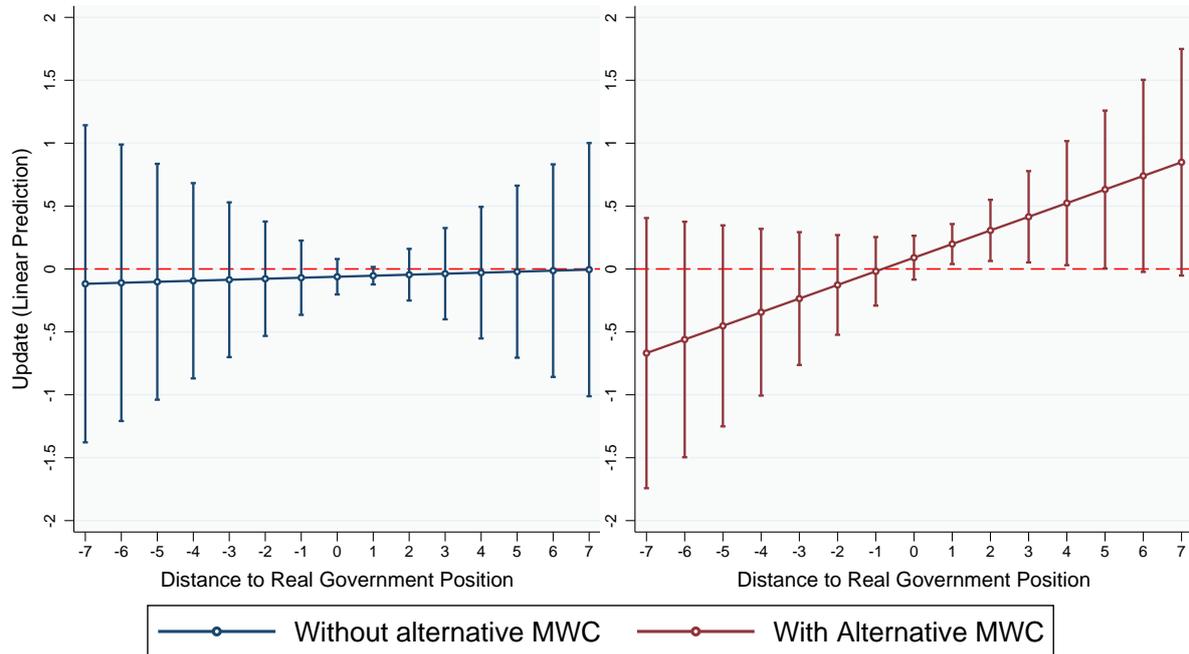
5 Evidence from Individual Panel Data: The Case of the Center Party in Norway 2005

The previous empirical analysis relies on aggregate-level data. That is, it defines updates in voter perceptions of a party's position as shifts in the *average* left-right placement given to a party. Hence, it offers cross-country evidence of the effect of parties' coalition behavior on how they are perceived by the electorate in general. The same aggregate trend, though, is consistent with multiple patterns of individual-level changes. Most importantly, our theoretical argument operates at the micro level as it is each individual voter who uses the information disclosed by the coalitional strategy of each party to update her beliefs about that party. Therefore, the ideal data to test our argument requires individual panel surveys, where the same respondents are asked about parties' positions before and after coalition formation.

For that reason, in this section we use individual-level panel data to offer further

evidence in support of our argument. In particular, for illustrative purposes, we focus on the case of the Norwegian Center Party (*Senterparteit*, Sp) in the coalition formation process of 2005.

The Sp was founded in 1920, essentially as an agrarian party. As its name suggests, though, the Sp is typically considered a centrist party from a left-right perspective. Since 1963, the Sp had been part of most of the right-of-the-center coalition cabinets that formed in Norway, in alternation with single-party social-democratic governments. As Allern and Aylott (2009) point out, it can be said that the Sp was originally anchored in the non-socialist bloc until the early two thousands: In 2001 it still advocated for the continuation of a centrist coalition that had been in office from 1997 to 2000. In July 2005, however, the SP struck a deal with the Norwegian Labor Party (*Det Norske Arbeiderparti*, DNA)[13] and the Socialist Left Party (*Sosialistisk Venstreparti*, SV) to run for the upcoming elections of September 2005 in separate lists but with a common policy agenda. This center-left agreement was explicitly considered as a pre-electoral commitment to form a joint coalition government in case the sum of the seats of the three parties reached the absolute majority in the *Storting* (the Norwegian parliament). The so-called red-green coalition eventually managed to win a narrow majority, obtaining a total of 87 seats that were enough to form a minimum winning coalition in a parliament with 169 seats.

The case of the Sp in 2005 is particularly interesting for several reasons. First, it is a centrist party that has reached coalition agreements with both the left and the right. Hence, it is a good candidate to test whether or not the actual coalition choice (left or right) dynamically affects voters perceptions over the position the party in the left-right scale. Second, the elections of 2005 allowed for the possibility of a right-of-center majority. That is, the Sp was arithmetically pivotal as it could have formed a center-right coalition government with the parties it had used to

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[13]Since 2011, *Arbeiderpartiet* (Ap).

coalesce with in the past —the Conservative Party (*Høyre*, H), the Christian Democratic Party (*Kristelig Folkeparti*, KrF), and the Liberal Party (*Venstre*, V)— plus the participation or implicit aquiescence of the Progress Party (*Fremskrittspartiet*, FrP).[14] This was unlikely given the pre-electoral deal with the DNA and the SV, but the key point here is that the coalition behavior of the Sp just before the 2005 was more than just a matter of political survival: It was "in line with the expectation of a party emphasizing policy [..., who] concluded that its goals were more attainable with new allies on the left" (Allern and Aylott, 2009, 273). In other words, we can confidently argue that, in 2005, the Sp made a (left-wing) *choice.* And third, the fact that the 2005 red-green coalition was the first left-of-the-center coalition that the Sp decided to participate in made it more likely that the coalition behavior of the party came as a surprise from the left-right point of view for a substantial share of the voters, making them update their beliefs over the real position of the party.

The data we use here is from the Norwegian Election Study (2001-2005). This is a panel survey consisting of a pre-election study in 2001 and a post-election one in 2005.[15] From 2001 to 2005 (before and after the red-green coalition formation, respectively), the average position attributed to the Sp by the respondents of the survey moved slightly to the left: From 4.44 to 4.34. This is consistent with the idea that participation in a coalition to the party's left moves the perceptions of where the party stands toward the left.

Nonetheless, the relevant question for our argument is which voters in particular made that update. Figure 2 shows the distribution of the position attributed to the Sp after the 2001 elections (*t*) and after the 2005 elections (*t+1*) for two groups of respondents. For the first group (panel on the left), the ideological distance between

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[14]Even if the FrP decided not to formally participate in a coalition government or was ruled out as a coalition partner by other these potential partners, "[i]t was clear that the Progress Party would become a centre-right coalition's primary support party, potentially providing a majority in numerous policy areas" (Allern and Aylott, 2009, 273).

[15]The fieldwork dates are Jun. 1st to Sep. 1st for the 2001 election study and Sep. 13th to Dec. 14th for the 2005 one. For further reference visit valgundersokelse.nsd.uib.no/webview/index/en/MyServer/Panelundersoekelser.d.5/ Norwegian-Election-Study-2001-2005-panel/fStudy/NSD1352

Figure 2: Distribution of Attributed Left-Right Positions of Sp
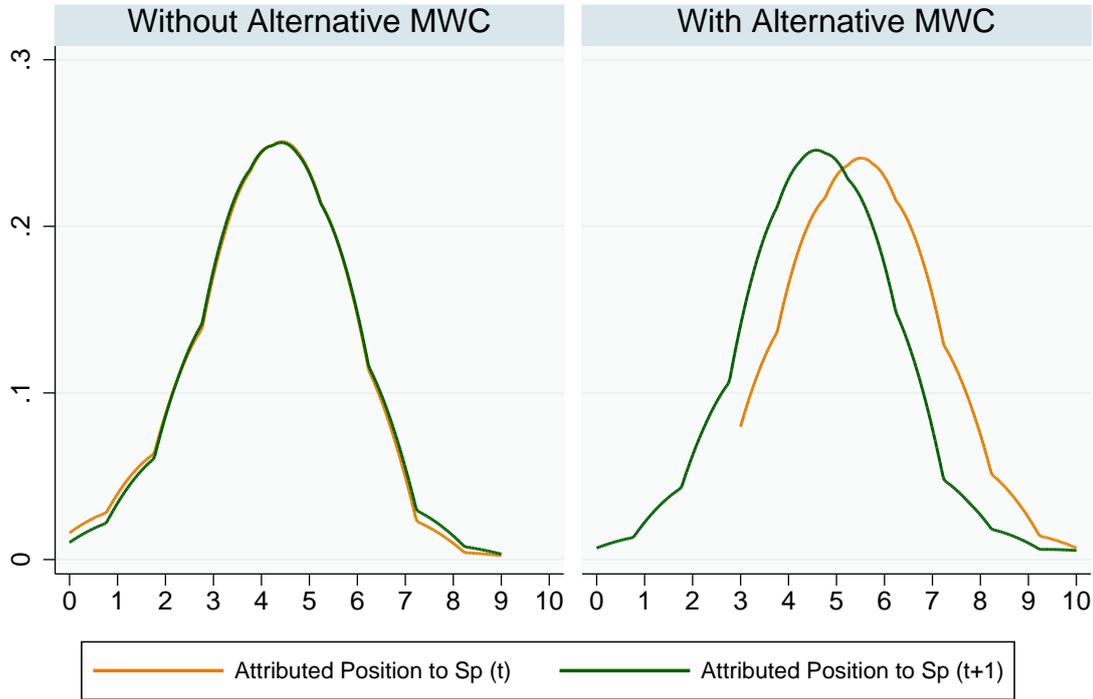
the Sp and the other members of the red-green alliance (DNA and SV) in 2001 was lower than the distance between the Sp and the potential right-wing coalition partners.[16] That is, for those in this group, the choice that the Sp eventually made of partnering with the DNA and the SV was ideologically congruent from the left-right perspective. In other words, this group perceived no other potential MWC different than the chosen one that was ideologically closer to the Sp. The Sp had hence no closer alternative from the point of view of these voters.

The second group (right panel) is composed of respondents who, before the red-green coalition was hammered out, thought that the Sp was closer to a center-right coalition than to the center-left coalition later formed. For these voters, the Sp had an alternative potential MWC that was ideologically closer than the coalition that

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[16]The perceived distances are again calculated à la Gamson (1961). That is, we subtract the attributed left-right position to the Sp from i) the seat-weighted average of the positions of the DNA, SV, and Sp to calculate the distance to the real government and from ii) the seat-weighted average of the positions of the H, the KrF, the FrP, and the Sp to calculate the distance to the alternative MWC.

Figure 3: Distribution of Update of Left-Right Positions of Sp
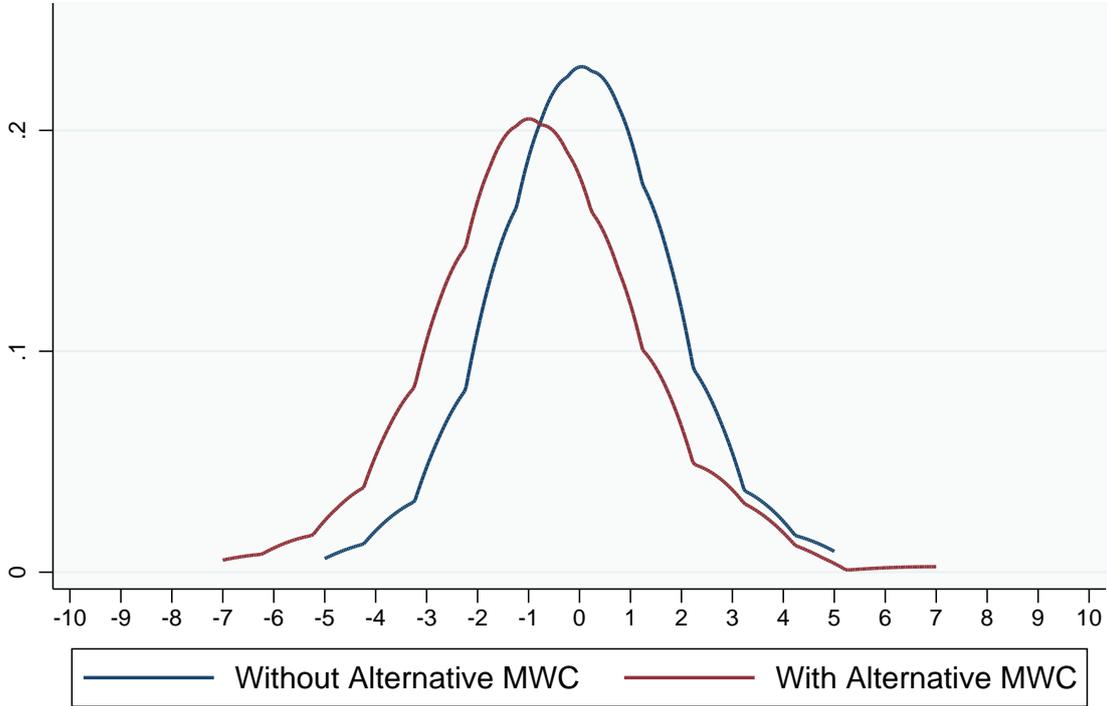
the Sp eventually formed. Our argument implies that *only* voters in this second group should update the placement they attribute to the Sp toward the position of the chosen coalition. This is precisely what we see in Figure 2: while the green and orange curves of the left-hand side panel overlap almost perfectly, the *t+1* curve in the right-hand side panel has clearly moved to the left of the *t* curve.

Another way to look at this is to compare the distributions of the update in perceptions of the Sp across these two groups of respondents. Figure 3 shows that, on average, voters who perceived the coalitional behavior of the Sp consistent with its left-right placement did not update their beliefs over the position of the party (almost symmetrical blue bell curve with a zero mean). In contrast, the red curve shows that those who thought that the Sp was closer to the center-right parties than to the left-leaning coalition it joined did update the position of the party toward the left.

As shown in Table 4, the difference in the average update across these two groups

Table 4: Mean Comparison T-Test of Update for Two Groups

Group	Obs.	Mean	[95% Conf. Interval]
Without Alt. MWC	547	0.086	[-0.045 , 0.216]
With Alt. MWC	135	-0.800	[-1.135 , -0.465]
Combined	682	-0.089	[-0.216 , 0.037]
Difference		0.886	[0.576 , 1.196]

is statistically significant. The group that perceived the Sp to have an ideologically closer MWC alternative, updated the position attributed to the Sp 0.8 points toward the left. By contrast, those for whom the Sp chose the MWC closest to its own position did not update the perception of where the Sp stood on the left-right scale. Indeed, the average update is less than a tenth of a point toward the right and it is not statistically significantly different from zero.

We now address two alternative explanations for our empirical evidence. First, it could be argued that the reason why some voters updated their belief over the position of the Sp toward the left had nothing to do with the information provided by the actual coalitional behavior of the party but with the fact that the Sp simply made an explicit programmatic shift from the center in 2001 to the left in 2005 that would have been equally perceived by voters even if the red-green coalition had not formed. Although that would not explain the difference between the two groups of respondents, it would be preferable to rule out this possibility. Using data from the Manifesto Project (CMP) (Volkens et al., 2014) we can see that while the Sp 2001 manifesto scored -27.3 in the CMP left-right scale (with a potential range from -100 to +100), the 2005 one actually moved slightly to the right (-17.6).[17] Hence, the possibility that voters' update of the Sp position was only driven by a change in its stated policy priorities is rendered unlikely by the information derived from its manifestos.

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[17]Source: manifestoproject.wzb.eu/parties/726 [Accessed April 10, 2015].

The second alternative account refers to the potential confounding effect of the position attributed to the Sp *ex ante*. The fact that a correlation exists between placing the Sp closer to the right at time t and perceiving that the Sp has a closer alternative MWC could be an indication that our evidence responds to a mechanical rather than a substantive effect. That is, it could be argued that the size of the update is larger when the position of the party was perceived to be more distant to the actual left-leaning partners in the first place, regardless of the position of the potential alternatives. If so, it would be the *ex ante* position of the party rather than the fact of having closer alternatives what would be driving the variation of our dependent variable. We control for this possibility with the same strategy we followed in the aggregate analysis.

In Table 5 we present the results of an OLS regression analysis where we estimate the extent to which perceiving a closer MWC alternative for the Sp conditions the effect of the *ex ante* perceived distance between the Sp and the coalition that finally formed (i.e. we include the interaction $Distance_{RG\text{-}Sp} * Alternative_{MWC}$). Similarly, in order to control for possible ceiling or floor effects, we introduce a control for the position attributed to the Sp at time t. Also, we bring ideological and socio-demographic heterogeneity between individuals into the model including controls for the respondents' level of education and age group, which may be a proxy for political sophistication and experience.

Column 1 offers the results of a bivariate regression model that basically confirms our previous findings. Perceiving that the Sp had a closer alternative to its right but finally decided to form a center-left coalition leads voters to shift their perception of the Sp to the left. Models 2 to 4 show that the effect of the perceived distance between the government that formed and the Sp is *different* for those that thought the alternative center-right coalition to be closer to the Sp and those that thought that the center-left coalition was actually its ideologically most congruent choice. In line with our argument, the effect of the distance RG-Sp is almost zero for the

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Table 5: Determinants of Sp Position Update

	(1)	(2)	(3)	(4)
Alternative$_{\text{MWC}}$	-0.886***	0.295**	0.250*	0.271*
	[0.158]	[0.140]	[0.142]	[0.144]
Distance$_{\text{RG-Sp}}$		-0.085*	-0.069	-0.071
		[0.048]	[0.048]	[0.048]
Distance$_{\text{RG-Sp}}$ * Alternative$_{\text{MWC}}$		0.184***	0.167***	0.170***
		[0.060]	[0.060]	[0.060]
Constant	0.086	3.465***	3.772***	3.641***
	[0.070]	[0.202]	[0.245]	[0.378]
L-R Sp Perception$_t$	no	yes	yes	yes
L-R Self Placement$_t$	no	no	yes	yes
Level of Education	no	no	no	yes
Age Group	no	no	no	yes
N	682	682	677	677
R^2	0.044	0.432	0.437	0.445

Standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Figure 4: Predictive Marginal Effects with 95% CI (Distance RG-Sp on Update)
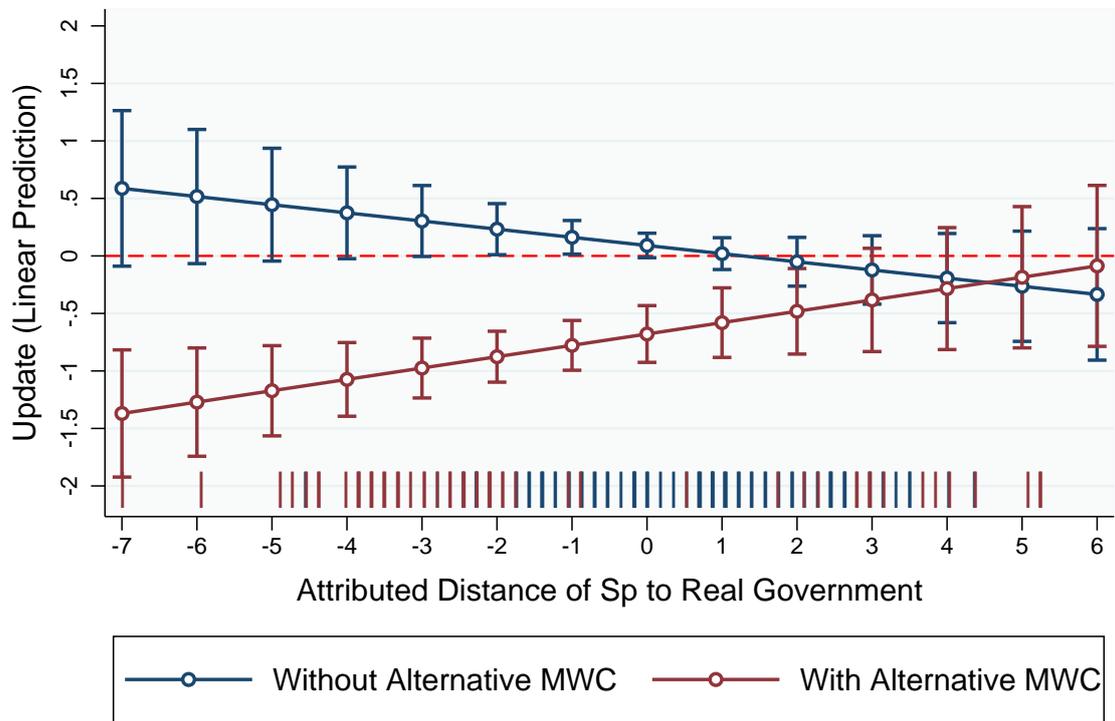
latter. However, for the former, the update is negative (i.e. to the left) for each distance score. Figure 4 graphs the linear predictions of the effect of $\text{Distance}_{\text{RG-Sp}}$ from the estimates in model 4. It is only for those few respondents who perceived the coalition to be clearly to the right of the Sp that the variable $\text{Alternative}_{\text{MWC}}$ makes no difference. For the rest, the only group of respondents that updates the Sp position towards the position of the left-leaning coalition it joins are those that considered the party to be closer to a center-right coalition.

Finally, we relax the strong linearity assumption behind the last models and show the results of a local polynomial regression predicting the update of the Sp attributed placement as a function of the perceived distance to the center-left coalition for the two relevant groups of voters (with and without perceived closer MWC alternative). Figure 5 presents an Epanechnikov kernel-weighted local polynomial smooth plot with 95% confidence intervals that shows that, for perceived distances between -4 and 0 (i.e perception of the government being to the left of the Sp), no update

Figure 5: Local Polynomial Smooth Plot with 95% CI (Distance RG-Sp on Update)
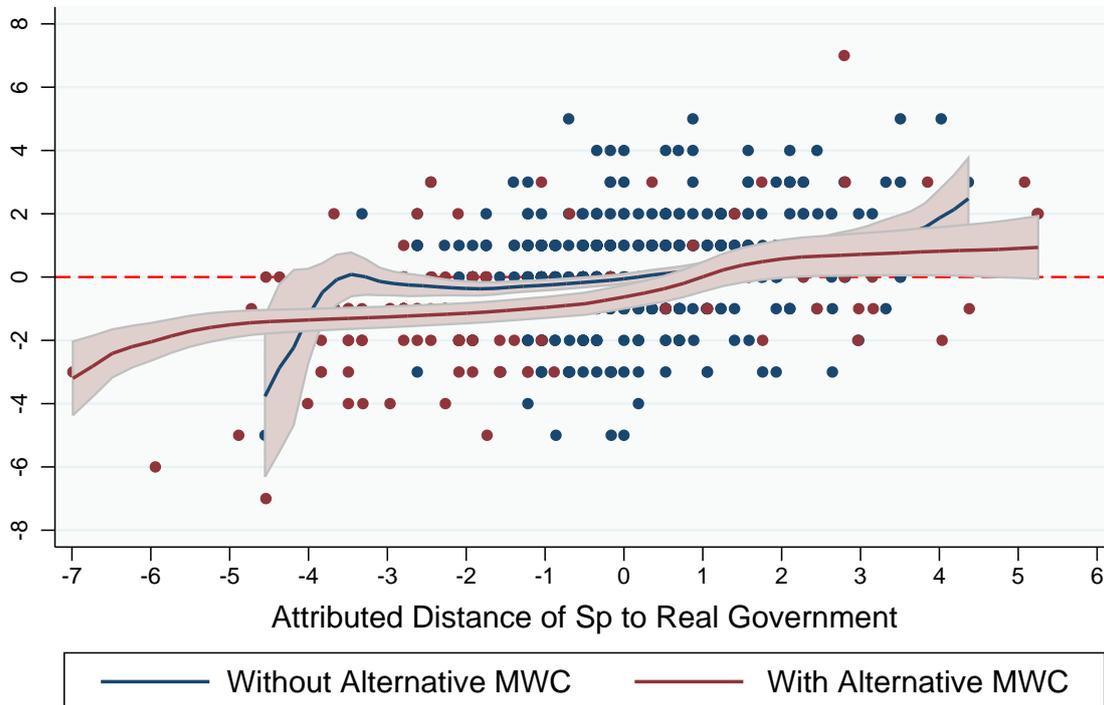
is made by those that thought the center-left coalition was the closest option for Sp, while those that perceived a center-right coalition to be closer did update their belief over the the position of the Sp toward the left (between -.5 and -2). Even in a non-parametric setting, therefore, our main hypothesis seems to hold.

6 The Timing of Survey Responses as a Natural Experiment: The British and German Liberals

As a further test of our hypothesis, we take advantage of the random ordering in which mass survey respondents are interviewed to compare the issue placement given to a political party immediately *before* and *after* it joins a coalition government. Fielding a public opinion survey may take several weeks and frequently a new government forms while a post-election wave is still being administered, which allows to distinguish two groups of respondents according to whether they completed

the questionnaire by the time the new cabinet was appointed or not.[18]

We estimate whether party issue placements are different across these two groups. For this purpose, our empirical strategy leverages the fact that the timing in which respondents are contacted is orthogonal to their political predispositions to identify whether forming a coalition changes perceptions of where the party stands. This empirical strategy provides a clean identification strategy not only because of the random ordering of survey responses but also because of the short time gap between the measurement of perceptions before and after the coalition. While the time distance between the pre and post measures in the aggregate and panel data above can be several years, when comparing respondents within the same post-election survey the gap is only a few days. This reduces the possibility that a difference in perceptions is due to factors other than the coalition announcement itself.

According to the logic of our argument, the perceived placement of a coalition partner should only be different for those interviewed after the cabinet forms if the party had the opportunity to choose between several alternative coalitions and the one that it eventually joined was not considered ex-ante the ideologically closest one. To evaluate this claim we examine two cases for which our theory has opposite predictions, the British Liberal Democrats in 2010 and the German Free Democratic Party in 2009.

These two parties, which belong to the same party family and seat together in the European Parliament,[19] also faced a similar strategic choice as they could decide between two alternative viable coalitions: the Liberal Democrats could partner with either the Conservative Party or with Labour (and some minor parties), and the German Free Democrats could either select the Christian Democratic Union or join a cabinet with both the Socialdemocratic Party and the Left Party. The key differ-

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[18]The Supporting Information presents randomization checks comparing the demographic characteristics of respondents interviewed before and after the coalition is announced in each of the two cases we consider.

[19]Both parties belong to the "Alliance of Liberals and Democrats for Europe" European parliamentary group.

ence is that, while the German liberals chose the option that citizens considered as the most ideologically consistent —a coalition with the Christian Democrats—, the British liberals preferred a government with the Conservatives, even though voters (and experts) thought that Labour had more similar issue stances. Hence, according to our hypothesis, we should observe a shift in the perceived placement of the British Liberal Democrats, but not for the German Free Democrats.

The British Liberal Democrats after the 2010 Election

For the first time in 36 years, the 2010 British general election did not provide any party with a parliamentary majority. Although the Conservative Party was the clear plurality winner, a minority government was not seen as a feasible option given the context of financial crisis and the prospect of legislative defeats.[20] Two alternative coalitions were on the table: a government between the Conservatives and the Liberal Democrats, and another between the latter and the Labour Party with the support of other minor parties.[21]

The Liberal Democrats eventually chose to ally with the Conservative Party.[22] Until that decision, however, most voters and experts of British politics had considered that the Liberal Democrats were closer to the Labour Party on policy issues. Table 6 presents the perceived issue placements of all three major British parties before the coalition formed and reports the percentage of citizens and country experts who thought that the Conservative Party was a more ideologically consistent choice for the Liberal Democrats than Labour. As can be seen, only a minority of respondents perceived the Conservatives to be closer on any of these issues. This implies that the decision of the Liberal Democrats was at odds with (most) citizens'

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[20]You can find evidence that a minority government was considered a problematic option in these newspaper stories: spiegel.de/opinion-a-uk-minority-government-would-not-last-long.html and news.bbc.co.uk/uk_news/politics/election_2010.stm.

[21]A government between the Liberal Democrats and Labour could plausibly count on the support of small parties like the Greens, the Scottish National Party, Plaid Cymru or the Social Democratic and Labour Party (SDLP) from Northern Ireland.

[22]For a detailed description of the bargaining process, see the BBC's documentary "Five Days that Changed Britain".

Table 6: Average party placements on policy issues *before* the 2010 election, and % of respondents that considered that a coalition with the Conservatives was more ideologically consistent than one with Labour. Mass and expert survey data.

	LibDem placement	Conserv placement	Labour placement	% Conservative closer
taxes & spending[1]	5.53	4.32	5.84	31%
fighting crime tradeoff[2]	4.82	3.99	5.07	36%
economic left-right[3]	4.33	7	4.44	0%
libertarian dimension[3]	2.56	6	4.67	22%

DATA SOURCES: (1) 2010 pre-election British Election Study internet survey, (2) pre-election British Election Study face-to-face survey, (3) 2006 Chapel Hill Expert Survey.
t-test p-values: $* < 10\%$ $** < 5\%$ $*** < 1\%$

priors about the party, and therefore we predict that the coalition will lead voters to update their beliefs accordingly.[23]

This is indeed what we find: While the issue placement of all other parties is not statistically different for those sampled after the coalition forms, in the case of the Liberal Democrats it shifts and becomes closer to the Conservative Party. We use data from the post-election wave of the British Election Study Internet Panel.[24] Of a total of $13,356$ respondents in this wave, $11,231$ were interviewed between the day after the general election (May 6th) and the date the two-party coalition is announced (May 11th). The remaining $2,125$ were contacted afterwards.[25] Respondents were asked to place all major parties on a 0-10 issue scale regarding the trade-off between effectiveness in the fight against crime and the rights of the accused, where 0 indi-

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[23]For the minority of voters that already placed the Liberal Democrats closer to the Conservatives before the coalition our argument predicts no update. Hence, our empirical strategy, by pooling all voters together, *underestimates* the size of the shift if *all* citizens viewed Labour as the ideologically most congruent choice.

[24]You can find detailed information on this this mass election survey in this link www.bes2009-10.org/bes-data/MEMOCIPS.pdf.

[25]The fieldwork ended May 24th. For a reference on the timing of the coalition formation, see www.cnn.com/2010/WORLD/europe/05/11/uk.cameron.conservative/.

Table 7: Average placement of the Liberal Democrats before and after the coalition with Conservative Party is announced. Trade-off between fighting crime and the rights of the accused. One-tailed difference in means t-test. Alternative hypothesis: after coalition, placement is closer to the "tough on crime" endpoint.

	before coalition placement	after coalition placement	Difference
Liberal Democrats	4.78	4.68	0.10**
N	11, 231	2, 125	

t-test p-values: $* < 10\%$ $** < 5\%$ $*** < 1\%$

cates that *reducing crime is more important* and 10 that the *rights of the accused* are more important. Given that, before the election, the Liberal Democrats were considered as more favorable to the "rights of the accused" than the Conservatives (Table 6, second row), our argument implies that joining the coalition will shift voter perceptions towards 0, i.e. "reducing crime is more important".

Table 7 provides evidence that, indeed, post-election wave respondents interviewed after the coalition was announced see the Liberal Democrats as tougher on crime than those contacted immediately before. The average placement shifts from 4.8 to 4.7, and this difference is statistically distinguishable from zero. To ensure that this shift is driven by the formation of a coalition and not part of a common trend in the placement of all British parties, we run a placebo test to check whether the perceived position of other parties also changes. As Table 8 shows, for all other parties the perception of respondents contacted after the coalition formed is not different from that of those interviewed before, suggesting that citizens are *only* updating about the Liberal Democrats, and that they are doing so because they thought that Labour was an ideologically closer alternative.

Table 8: Placebo test. Average placement before and after the coalition with Conservative Party is announced. Self-placement, Conservative placement and Labour placement. Tradeoff between fighting crime and the rights of the accused. Difference in means t-test.

	before coalition placement	after coalition placement	Difference
Self-placement	2.63	2.66	-0.03
Conservative party	3.08	3.17	-0.09
Labour party	3.49	3.43	0.06
N	$11,231$	$2,125$	

t-test p-values: $*< 10\%$ $**< 5\%$ $***< 1\%$

The German Free Democratic Party in 2009

In the case of the German Free Democratic Party (*Freie Demokratische Partei*, FDP), on the other hand, we do not expect an update in voter perceptions. While the FDP could also choose between two alternative multiparty cabinets, one with the Christian Democrats (*Christlich Demokratische Union/Christlich-Soziale Union*, CDU/CSU) and another with both the Social Democratic Party (*Sozialdemokratische Partei Deutschlands*, SPD) and The Left (*Die Linke*), it opted for the coalition that voters considered ideologically closer, i.e. that with the CDU/CSU. As the evidence in Table 9 indicates, most participants in the pre-election wave of the 2009 German Election Study thought the FDP was closer to a coalition with the CDU/CSU for all issues they were asked about.[26] This implies that forming a cabinet with the CDU/CSU and enabling Angela Merkel to become Chancellor was consistent with (most) voters' priors, and hence these should not update their perceptions.

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[26]For further information about the 2009 German Election Study and the content of its questionnaires, please see the GESIS archive.

Table 9: Average party placements on policy issues *before* the 2009 election and % of respondents that considered that a coalition with CDU/CSU was more ideologically consistent.

	FDP placement	CDU placement	SPD placement	% CDU/CSU closer
left-right	5.66	6.51	3.72	75%
taxes & spending	3.50	4.26	5.37	65%
libertarian dimension	5.64	6.20	4.29	58%
nuclear policy	3.70	3.03	5.90	64%

Data Source: pre-election wave 2009 German Longitudinal Election Study (GLES).

Data from the post-election wave supports this prediction, as can be seen in Table 10. Respondents contacted after the coalition agreement was announced do *not* have statistically different opinions about the position of the Free Democrats on any of the four issues included in the questionnaire.[27] Thus, joining a coalition government did not change the policy reputation of the FDP.

Taken together, the examples of the British Liberal Democrats and the German Free Democrats, offer additional support to our argument that multiparty governments provide information about a coalition member's policy preferences *only* when it does not choose the ideologically closest coalition alternative.

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[27]The CDU/CSU — FDP coalition was announced on October 24th 2009 (http://news.bbc.co.uk/2/hi/europe/8323651.stm). Of the participants in the post-election wave of the 2009 German Election Study, 894 were contacted before the coalition formed and 1221 were interviewed after.

Table 10: Average placement of the German Free Democratic Party before and after the coalition with the CDU/CSU is announced. German Longitudinal Election Study, post-election wave. One-tailed difference in means t-test. Alternative hypothesis: group interviewed *after* the coalition places the FDP closer to the CDU/CSU position.

	before coalition placement	after coalition placement	Difference
left-right	5.85	5.79	0.06
taxes & spending	3.08	2.90	0.18
libertarian dimension	5.90	5.98	−0.08
nuclear policy	3.23	3.18	0.05
N	894	1,221	

t-test p-values: $* < 10\%$ $** < 5\%$ $*** < 1\%$

7 Concluding Remarks

Spatial models of elections argue that voting decisions hinge on citizens' issue preferences and their perceptions of where parties stand on those issues. In this paper we have looked at a potential factor driving these voter perceptions of party positions: A party's decision to join a coalition government.

Our paper has specified the scope conditions for the argument that coalition membership reshapes voter perceptions of party issue positions, as originally advanced by Fortunato and Stevenson (2013). We have claimed that joining a coalition is informative about a party's ideological commitments *only* when the party can choose from several alternative coalitions and the one that it joins was not seen as the ideologically closest option. Otherwise, choosing the coalition that voters already considered as the most ideologically consistent simply confirms voters' prior beliefs about the party's position.

We have adopted three complementary empirical approaches to evaluate our

claim: aggregate-level data on voter perceptions of party left-right positions across five Western European countries where coalition governments are common, individual-level panel data from Norway, and a quasi-experiment comparing the perceptions of survey respondents interviewed before and after a coalition is announced.

In all three cases, the evidence supports our theoretical argument. We first show that the left-right image of parties that join a coalition shifts towards the overall coalition's position *only* when voters thought that the party had options that were more ideologically congruent. Otherwise there is no update. Looking at changes in voters' perceptions of the Norwegian Center Party after it formed a left-leaning coalition in 2005, we find that panel participants that in 2001 already placed the party closer to its future partners than to right-wing parties did not update their perceptions in 2005. In contrast, those that saw the party closer to a right-leaning coalition in 2001 *did* change their mind about the party's position. Finally, comparing respondents within the same post-election survey that are contacted before and after a coalition forms, we show that, while issue placements shift when a party chooses a coalition that is not considered the ideologically closest option —the British Liberal Democrats in 2010—, they do not when the party joins the coalition seen as the ideologically natural choice —The German FDP in 2009—.

Taken together, our results confirm our hypothesis that voters update their beliefs *only* when the party enters a coalition that was not considered as the most ideologically congruent. In other words, the choice of a coalition must come as a surprise in the sense of contradicting the prior beliefs that voters had about the party's ideology.

We are aware that, even when there is an update in voters' opinions, the magnitude of such shift is limited. When set against the strong stability in Western European parties' left-right images, however, even small changes in voter perceptions are meaningful. Indeed, Dalton and McAllister (2015, p. 770) report that the median shift in average perceptions across two consecutive elections is only 0.29

points on a 0-10 scale.[28] In this context, our estimates in table 3 imply that joining an ideologically "unexpected" cabinet located at the median distance between coalitions and parties shifts voter opinions by 0.18 points, a notable 62% increase over the normal volatility in party images.[29]

This paper has important implications for democratic theory and party strategies. We show that voter perceptions of party ideologies are responsive to party decisions to join coalition governments. Our results suggest that voters observe party actions and reevaluate their perceptions, either confirming their prior opinion or adjusting it. Hence our paper is part of a recent stream of work indicating that, whereas voters generally discount party rhetoric as uninformative (Adams, Ezrow and Somer-Topcu, 2011; Fernandez-Vazquez, 2014), they revise their opinions when parties make decisions with tangible policy consequences (Grynaviski, 2010; Lupu, 2014).

In addition, while the literature has emphasized how multiparty governments reduce the clarity of responsibility and undermine retrospective voting (Powell and Whitten, 1993), we show that cabinet partners are held accountable for their coalitional choices vis-à-vis their ideological reputation. Joining a cabinet that is not seen as the most ideologically congruent option reshapes the party's ideological image and thus may influence its electoral support. Such electoral consequences of coalition participation feed into the calculations of party elites. Insofar as changes in voter opinions about the party can damage the party's electoral prospects, party officials face a dilemma between obtaining office benefits now and incurring vote losses in the future.

This paper can thus help explain two regularities in coalition politics, one, that participation in government coalitions is associated with vote losses in the subse-

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[28]Dalton and McAllister data overlaps with ours. They rely on CSES data for voter perceptions and therefore they cover more countries —some of them outside of Western Europe— but for a shorter period of time. In any case, the median shift in average perceptions of left-right positions in our data is 0.25.

[29]The median distance between the perceived position of a party and the coalition that it joins is 2.2 units on the left-right scale according to our cross-country data.

quent election and, two, the prevalence of minority governments where some parties support the cabinet without formally entering the coalition. Indeed, our findings point to a mechanism through which coalition participation can be electorally costly: joining sides with partners that are perceived to be ideologically at odds can damage the party brand. This, in turn, helps account for the reluctance of certain parties to be part of a multiparty cabinet.

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Supporting Information

A Model of Voter Updating

General elections have just been held but a new government has not been formed yet. The future cabinet must implement a policy on an issue X. Positions on this issue, x, are defined as a point on the real line. Political parties have an ideal policy on this issue x_j, where $x_j \in X \ \forall j \in J$, and J denotes the set of parties in the system. When a party joins the government, it obtains a policy payoff that is strictly decreasing in the distance between x_j and the overall cabinet position.

A party's ideal point is not directly observable, but voters have beliefs about it. Such prior perceptions are represented by a normal distribution with density function $f_{prior}(x_j)$.[30] Given their beliefs, voters' best guess about a party's issue position —the expected value of x_j— is defined by μ_j. If party j joins a coalition cabinet, voter opinions about the party are updated using Bayes' rule.

Two viable coalitions may form, A and B, with overall issue positions x_A and x_B, where without loss of generality $x_A > x_B$. Both potential governments include party j. Party j will choose coalition A if and only if its ideal point is closer to x_A than to x_B. Hence, if coalition A forms, party j's ideal point must be such that it is to the right of the midpoint between both coalitions, i.e. $x_j \geq \frac{1}{2}(x_A + x_B)$. This means that the likelihood of observing this coalition is positive and uniform over such interval, but zero anywhere else. Given this likelihood function, once voters observe that cabinet A is appointed their opinion about where party j stands becomes a normal distribution left-truncated at the midpoint between the two coalitions $\frac{1}{2}(x_A + x_B)$. Voters now infer that the party is closer to position x_A and thus place 0 probability on issue positions that are to the left of the midpoint. The posterior best guess

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[30]Defining prior beliefs as a normal distribution has the benefit that it assumes that voters put non-zero probability on *all* possible ideal points and, as a result, updating is not constrained to any subregion of the policy space: a party perceived as left-wing may end up developing a right-wing reputation as a result of its own behavior. Voter priors do not prevent it from happening.

about where party j stands becomes:

$$\mathrm{E}_{posterior}\left(x_j\right) = \mu_j + \sigma \frac{\phi\left(\frac{\frac{1}{2}(x_A+x_B)-\mu_j}{\sigma}\right)}{1-\Phi\left(\frac{\frac{1}{2}(x_A+x_B)-u_j}{\sigma}\right)}$$

where μ_j is the initial voter best guess, σ the initial uncertainty, while $\phi(\cdot)$ and $\Phi(\cdot)$ indicate, respectively, the probability density and cumulative density function of a normal distribution.

The *shift* in citizens' best guess about where party j's preferences lie is thus defined as

$$\mathrm{shift}_j = \mathrm{E}_{posterior}\left(x_j\right) - \mu_j$$
$$= \sigma \frac{\phi\left(\frac{\frac{1}{2}(x_A+x_B)-\mu_j}{\sigma}\right)}{1-\Phi\left(\frac{\frac{1}{2}(x_A+x_B)-u_j}{\sigma}\right)}$$

The value of shift_j is always positive, which indicates that membership in coalition A shifts perceptions to the right. The *magnitude* of the update in voter perceptions, however, depends on what they initially thought about the party. The partial derivative of the shift with respect to the initial opinion μ_j is negative for any μ_j, and therefore the magnitude of the update decreases the more to the right the initial voter guess. For any value of σ, the higher μ_j, the higher the initial voter confidence that party j was closer to coalition A, and therefore the key implication is that the more certain voters were that the party was closer to the coalition it joined, the smaller the update in perceptions.[31]

Figure 6 illustrates the logic of the model by comparing two scenarios. In the first (top panel), voters thought that the party was closer to coalition B. In the second (bottom panel), voters agreed that coalition A was the most ideologically consistent option for the party. This figure plots the prior and posterior beliefs, the

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[31]The analytic proofs for this relationship between initial priors and size of the update is offered below.

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initial and final best guesses about where the party stands, μ and $\mu_{posterior}$, as well as the overall coalition positions x_A, x_B with their midpoint k.

Figure 6: Illustrating the model of voter updating about a party that joins a coalition cabinet. Two alternative viable choices for this party: coalition A, with position x_A, and coalition B, with position x_B. Coalition A is the cabinet that forms. On the top panel, the focal party was initially placed closer to coalition B. On the bottom, closer to coalition A.
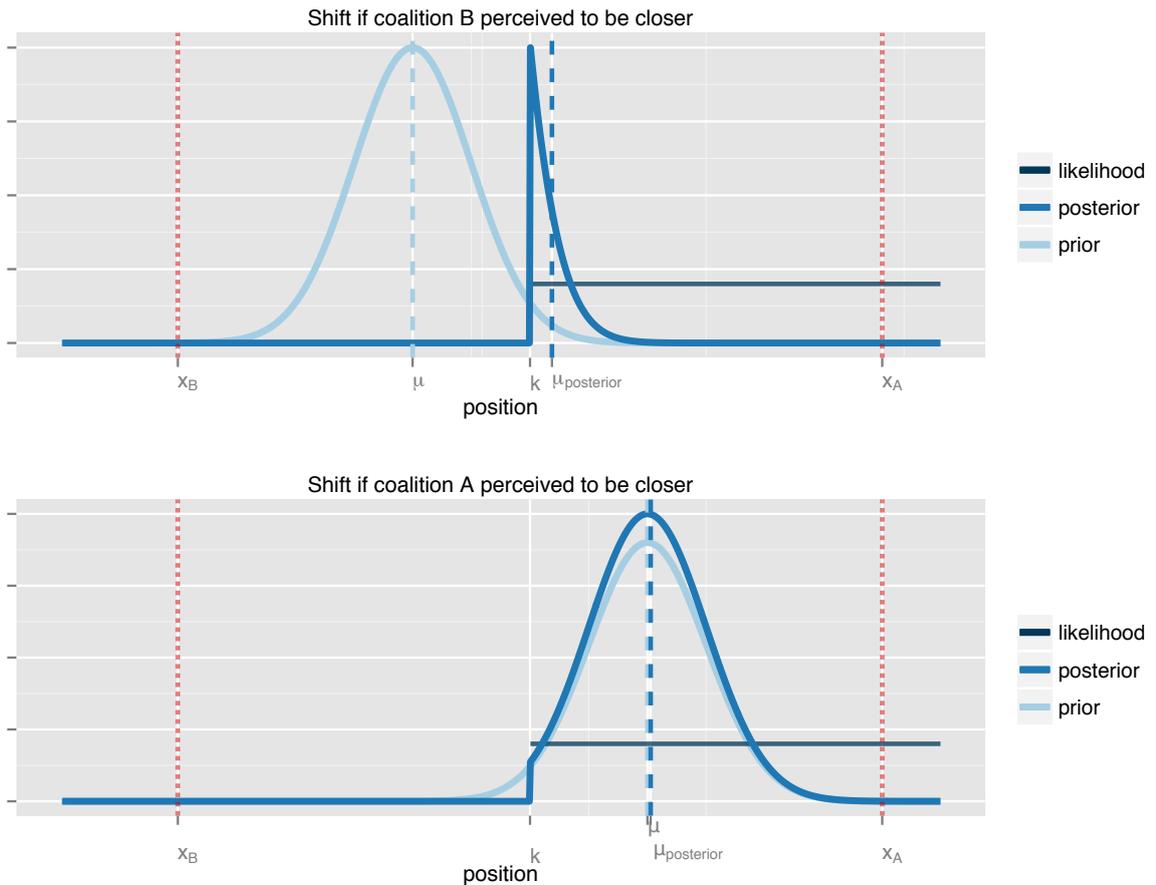
While the shift in voter perceptions of where the party stands is substantial in the first case, it is negligible in the second. The underlying mechanism is that choosing coalition A indicates that the party's position is to the right of the midpoint k and hence posterior beliefs place zero probability on positions to the left of it. Whereas on the top panel this forces voters to reconsider their initial opinion that the party was closer to B, on the bottom panel citizens already thought that the party was closer to A —most of the prior distribution lies to the right of the midpoint— and

therefore the choice of coalition partners only confirms their priors.

In sum, the model implies that the more confident citizens were that the coalition joined is the ideologically closer, the smaller the change in perceptions. Since survey data measuring voter perceptions of party positions does not include information on respondents' uncertainty about these placements, the explanatory factor that we use is an indicator of whether the party placement —respondents' best guess— is closer to the coalition that it joins or to any of the alternatives.

Voter Updating Model. Formal Proofs.

Given the overall position of coalitions A and B x_A and x_B where wlog $x_A > x_B$, observing that the focal party joins cabinet A implies that $x_j \geq \frac{1}{2}(x_A + x_B)$. Hence, the likelihood of observing this choice for each possible party ideal point is defined as the uniform distribution $unif(\frac{1}{2}(x_A + x_B), \infty)$, with probability density function

$$\begin{cases} k > 0 & \text{if } x_j \geq \frac{1}{2}(x_A + x_B) \\ 0 & \text{if } x_j > \frac{1}{2}(x_A + x_B) \end{cases}$$

Applying Bayes's rule to derive the posterior belief —where voters place the party after it joins coalition A—, the posterior density is defined as:

$$f(x_j \mid choosing\ A) \propto unif\left(\frac{1}{2}(x_A + x_B), \infty\right) \cdot f(x_j)$$

Given that the likelihood is 0 for $x_j > \frac{1}{2}(x_A + x_B)$ and $k > 0$ otherwise, the posterior distribution is a truncated normal. The expected value of a normal function left-truncated at $\frac{1}{2}(x_A + x_B)$ is:

$$E\left[x_j \mid x_j \geq \frac{1}{2}(x_A + x_B)\right] = \mu_j + \sigma \frac{\phi\left(\frac{\frac{1}{2}(x_A + x_B) - \mu_j}{\sigma}\right)}{1 - \Phi\left(\frac{\frac{1}{2}(x_A + x_B) - u_j}{\sigma}\right)}$$

where μ_j is the mean of the prior belief, $\phi(\cdot)$ is the probability density function of a

standard normal, and $\Phi(\cdot)$ the cumulative density function of the standard normal.

Therefore, the shift in the expected value of voter beliefs becomes

$$\sigma \frac{\phi\left(\frac{\frac{1}{2}(x_A + x_B) - \mu_j}{\sigma}\right)}{1 - \Phi\left(\frac{\frac{1}{2}(x_A + x_B) - u_j}{\sigma}\right)}$$

This shift is positive for any initial best guess μ_j since $\sigma > 0$, $\phi(\cdot) \geq 0$ and $\Phi(\cdot) \leq 1$.

The magnitude of the shift depends on the initial belief. The partial derivative of the shift with respect to the initial first guess is

$$\frac{\partial shift}{\partial \mu_j} = \sigma \frac{\partial \phi\left(\frac{\frac{1}{2}(x_A + x_B) - \mu_j}{\sigma}\right)}{\partial \mu_j} \left[1 - \Phi\left(\frac{\frac{1}{2}(x_A + x_B) - u_j}{\sigma}\right)\right]^{-1}$$

$$+ \quad \sigma \phi\left(\frac{\frac{1}{2}(x_A + x_B) - \mu_j}{\sigma}\right) \frac{\partial \left[1 - \Phi\left(\frac{\frac{1}{2}(x_A + x_B) - u_j}{\sigma}\right)\right]^{-1}}{\partial \mu_j}$$

It can be shown that the partial derivative is negative for any μ_j. By definition, the standard deviation σ and the pdf of a normal distribution are non-negative function, hence $\sigma \phi\left(\frac{\frac{1}{2}(x_A + x_B) - \mu_j}{\sigma}\right) \geq 0$. Since $\Phi(\cdot) \leq 1$, then $\left[1 - \Phi\left(\frac{\frac{1}{2}(x_A + x_B) - u_j}{\sigma}\right)\right]^{-1} \geq 0$.

We show first that the partial derivative is negative for $\mu_j < \frac{1}{2}(x_A + x_B)$.

Note that $\frac{\partial \left[1 - \Phi\left(\frac{\frac{1}{2}(x_A + x_B) - u_j}{\sigma}\right)\right]^{-1}}{\partial \mu_j} = \left(-\left[1 - \Phi\left(\frac{\frac{1}{2}(x_A + x_B) - u_j}{\sigma}\right)\right]^{-2}\right)\left(-\frac{\partial \Phi\left(\frac{\frac{1}{2}(x_A + x_B) - u_j}{\sigma}\right)}{\partial \mu_j}\right)$.

Now, since $\Phi(\cdot)$ is the cdf of the standard normal and $\frac{\partial \frac{\frac{1}{2}(x_A + x_B) - u_j}{\sigma}}{\partial \mu_j} < 0$, then $\frac{\partial \Phi\left(\frac{\frac{1}{2}(x_A + x_B) - u_j}{\sigma}\right)}{\partial \mu_j} < 0$. Therefore,

$$\frac{\partial \left[1 - \Phi\left(\frac{\frac{1}{2}(x_A + x_B) - u_j}{\sigma}\right)\right]^{-1}}{\partial \mu_j} < 0 \quad \forall \mu_j$$

Regarding $\frac{\partial \phi\left(\frac{\frac{1}{2}(x_A + x_B) - \mu_j}{\sigma}\right)}{\partial \mu_j}$, we know that the standard normal pdf increases monotonically as the argument approaches 0. Therefore

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$$\frac{\partial \phi\left(\frac{\frac{1}{2}(x_A+x_B)-\mu_j}{\sigma}\right)}{\partial \mu_j} = \begin{cases} > 0 & \text{if } \mu_j < \frac{1}{2}(x_A+x_B) \\ < 0 & \text{if } \mu_j > \frac{1}{2}(x_A+x_B) \\ 0 & \text{if } \mu_j = \frac{1}{2}(x_A+x_B) \end{cases}$$

Hence, we have now shown that $\frac{\partial shift}{\partial \mu_j} < 0$ for $\mu_j \leq \frac{1}{2}(x_A+x_B)$. To show that $\frac{\partial shift}{\partial \mu_j} < 0$ for $\mu_j < \frac{1}{2}(x_A+x_B)$, note that $\frac{\partial shift}{\partial \mu_j}$ can also be expressed as

$$e^{-\frac{\left(\frac{1}{2}(x_A+x_B)-\mu_j\right)^2}{\sigma^2}} \frac{\left(\frac{-\sigma}{\pi} - \frac{e^{\frac{\frac{1}{2}(x_A+x_B)-\mu_j}{2\sigma^2}}\left(\frac{1}{2}(x_A+x_B)-\mu_j\right)\left(-2+\text{erfc}\left(\frac{\mu_j-\frac{1}{2}(x_A+x_B)}{\sqrt{2}\sigma}\right)\right)}{\sqrt{2\pi}}\right)}{2\left(\sigma - \frac{1}{2}\sigma\text{erfc}\left(\frac{\mu_j-\frac{1}{2}(x_A+x_B)}{\sigma\sqrt{2}}\right)\right)^2}$$

where $\text{erfc}(\cdot)$ is the complementary error function.[32] Since the denominator and $e^{-\frac{\left(\frac{1}{2}(x_A+x_B)-\mu_j\right)^2}{\sigma^2}}$ are positive, it suffices to show that $\frac{-\sigma}{\pi} - \frac{e^{\frac{\frac{1}{2}(x_A+x_B)-\mu_j}{2\sigma^2}}\left(\frac{1}{2}(x_A+x_B)-\mu_j\right)\left(-2+\text{erfc}\left(\frac{\mu_j-\frac{1}{2}(x_A+x_B)}{\sqrt{2}\sigma}\right)\right)}{\sqrt{2\pi}}$ is negative. Given that $\frac{-\sigma}{\pi}$ is negative, a sufficient condition is that the second term is positive. Now, since $\sqrt{2\pi}$ and $e^{\frac{\frac{1}{2}(x_A+x_B)-\mu_j}{2\sigma^2}}$ are both non-negative, what must be shown is that $\left(\frac{1}{2}(x_A+x_B)-\mu_j\right)\left(-2+\text{erfc}\left(\frac{\mu_j-\frac{1}{2}(x_A+x_B)}{\sqrt{2}\sigma}\right)\right) > 0$.

Our focus now is on situations where $\mu_j < \frac{1}{2}(x_A+x_B)$. Hence $\left(\frac{1}{2}(x_A+x_B)-\mu_j\right) > 0$ and what needs to be shown is that $\left(-2+\text{erfc}\left(\frac{\mu_j-\frac{1}{2}(x_A+x_B)}{\sqrt{2}\sigma}\right)\right) > 0$. Thus, it must be the case that

$$\text{erfc}\left(\frac{\mu_j-\frac{1}{2}(x_A+x_B)}{\sqrt{2}\sigma}\right) > 2$$

Using the properties of the complementary error function, that is always the case. Therefore, we have proved that

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[32] For further information on these function, see http://mathworld.wolfram.com/Erfc.html.

$$\frac{\partial shift}{\partial \mu_j} < 0 \quad \forall \ \mu_j$$

Evidence form Aggregated Data at the Party Level: Model in Levels

We present the model in which we define the outcome of interest in levels rather than changes on Table 11. In this case, the dependent variable is the average party left-right position after the election. Our goal is to test whether such placement can be perfectly predicted using the previous voter placement of the party ($Position_t$), and we do so across different values of $Party\ Status$ and $Alternative_{MWC}$. These estimates result from the following linear regression model:

$$Position_{t+1} = \alpha + \beta_1 Position_t + \beta_2 Position_{RG} + \beta_3 Party\ Status + \beta_4 Alternative_{MWC}$$

$$+ \beta_5 Party\ Status * Alternative_{MWC}$$

$$+ \beta_6 Position_t * Party\ Status$$

$$+ \beta_7 Position_t * Alternative_{MWC}$$

$$+ \beta_8 Position_t * Party\ Status * Alternative_{MWC}$$

$$+ \beta_9 Position_{RG} * Party\ Status$$

$$+ \beta_{10} Position_{RG} * Alternative_{MWC}$$

$$+ \beta_{11} Position_{RG} * Party\ Status * Alternative_{MWC}$$

Table 11: Marginal effects of $Position_t$ on $Position_{t+1}$

Party Status	Alternative MWC	dy/dx	s.e.	$\beta < 1$?
All Parties		0.942***	0.024	YES***
Government Parties		0.916***	0.064	YES***
Government	NO	0.973***	0.125	NO
Government	YES	0.862***	0.044	YES***

Standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

In order to examine whether the formation of a new government changes per-

ceptions of party positions, we use the following benchmark: If the government formation reveals no information about party ideologies, voters will locate the party in the same position as before the election along with some white noise. In that case, we should observe that the marginal effect of the prior perception $Position_t$ on the post-election placement $Position_{t+1}$ is 1. In other words, the position attributed to a party after the new government forms should be perfectly predicted by the position that was attributed to it before that process.

Our results show, however, that the connection between $Position_t$ and $Position_{t+1}$ is not perfect in all cases. When we consider the whole sample of parties, the marginal effect of the prior placement is 0.942, with an associated linear coefficient that is statistically different (smaller) than 1. Most importantly, the capacity of prior perceptions to predict post-election opinions depends on coalition partners having had an alternative MWC that was perceived to be ideologically closer. If there was no such viable alternative, the post-election placement is fully predicted by earlier voter opinions, as the linear coefficient is not different from 1. On the other hand, if there was a more ideologically congruent alternative coalition, voter perceptions change: Indeed, it is in this case where the post-election placement is worst predicted by citizen pre-election opinions (i.e. it is the β that most differs from 1).

Figure 7 illustrates the effect of coalition membership effect on party ideological reputations and the fundamental difference that exists between those coalition members that had an ideologically closer alternative MWC and those that did not. For the latter the connection between $Position_t$ and $Position_{t+1}$ is strongest and almost perfectly overlaps with the 1:1 45° dashed line. Conversely, for those coalition members that could have participated in a closer alternative MWC, the line in red significantly differs from the dashed line, which indicates that something has happened between t and $t+1$ that made voters locate these parties in a different position than before the formation process. This piece of evidence, therefore, offers

Figure 7: Predictive Marginal Effects with 95% CI (Only Government Parties)
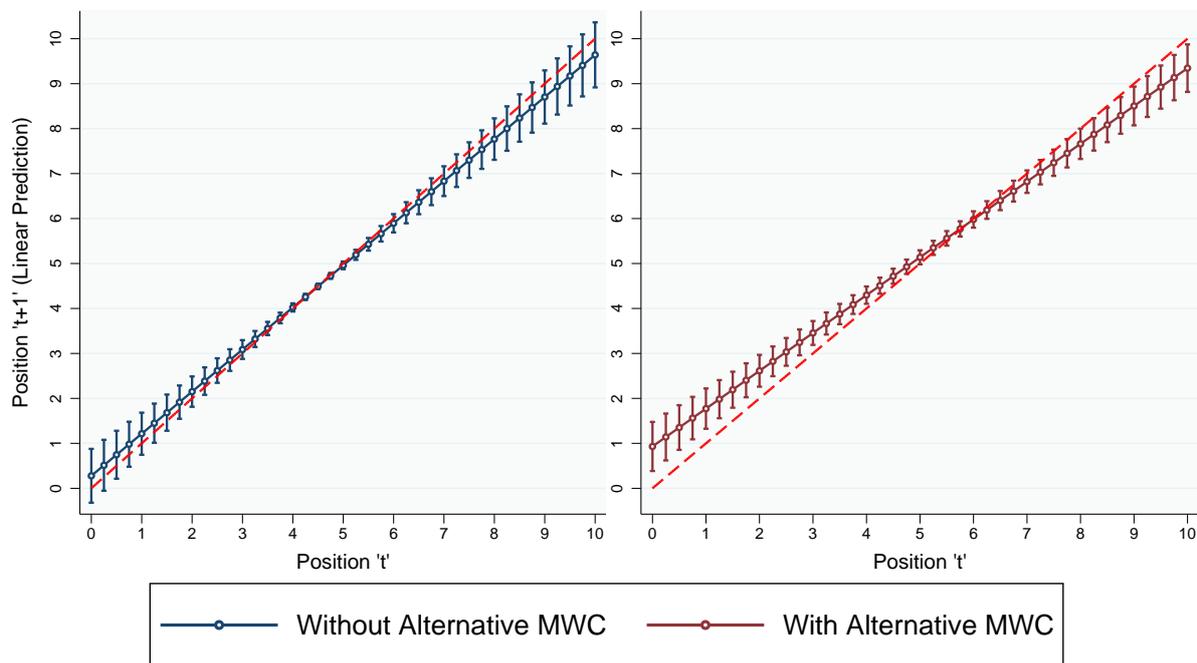
further support to our hypothesis.

Randomization Checks for quasi-experimental design:

The following analysis assesses whether the timing survey respondents are contacted is effectively orthogonal to their characteristics. For each case that we consider — the British Liberal Democrats in 2010 and the German FDP in 2009—, we present balance tests that compare respondents interviewed before and after the coalition is announced along several socio-demographic traits.[33] If timing is indeed random, then both groups of respondents should not diverge with regard to these socio-demographic factors.

Table 12 presents such comparison for the case of Britain. The second column reports average demographic characteristics for the group of respondents who, in the post-election wave of the British Election Panel, were interviewed before the coalition formed, while the third column reports that of those interviewed afterwards. The demographic data was recorded in the pre-campaign wave.

Results show that there are no systematic disparities in socio-demographic characteristics between both groups. Differences in average responses are small and in most cases these are not statistically distinguishable from zero. In the two instances were the difference is statistically significant —age and gender—, such divergence is substantively minimal and therefore we can attribute the statistical significance to the large sample size (over $13,000$ respondents).

Table 13 compares the pre and the post coalition groups within the post-election wave of the 2009 German Longitudinal Election Study. It also shows that there are no significant demographic differences across both groups. Hence, we can be more confident that the timing of participation in the survey is random and therefore uncorrelated with pre-existing views about the policy positions of political parties.

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[33]These traits are exogenous to short-term political events like the formation of a new cabinet. Therefore, if there were systematic differences across both groups then it would mean that the timing of survey participation is not random.

Table 12: Balance tests. 2010 British Campaign Panel Study.

	before coalition group	after coalition group	Difference
marital status	0.58	0.56	-0.02
gender	0.49	0.54	0.05∗∗
education	0.14	0.13	0.01
income level	7	7.1	0.1
religious	0.47	0.46	0.1
housing	0.78	0.77	0.01
ethnicity	0.04	0.04	0
age	51	49	2∗∗
trade union	0.19	0.20	0.01
Sample size (N)	11, 231	2, 125	

DATA SOURCE: 2010 pre-election wave British Election Study Internet Panel. Marital status indicates proportion of respondents that are currently married. Education reflects the proportion of participants that finished their full-time education at age 15 or earlier. Housing denotes the proportion that owns her current residence. Ethnicity is defined as the proportion of non-white respondents. Trade union indicates the proportion that declares to be a member of a trade union. t-test p-values: ∗< 10%   ∗∗< 5%

Table 13: Balance tests. 2009 German Longitudinal Election Study.

	before coalition group	after coalition group	Difference
age	50	50	0
gender	0.50	0.55	0.05**
marital status	0.49	0.52	0.03
household size	2.1	2.1	0
income level	4.9	5.1	0.2
education	0.35	0.38	0.03
employment	0.36	0.34	0.02
religious denomination	0.27	0.25	0.02
country of birth	0.06	0.06	0
Sample size (N)	894	1121	

DATA SOURCE: 2009 German Longitudinal Election Study (GLES), post-election wave. Education indicates the proportion of respondents with intermediary secondary education. Employment denotes the proportion of respondents with full-time jobs. Religious denomination defines respondents who belong to the German Protestant Church. Country of birth indicates the proportion of respondents born outside of Germany.

t-test p-values: $*< 10\%$ $**< 5\%$